

LESSON PLAN

Name:

Date: April 1, 2010

Subject: Science

Grade Level: 3rd

Length of Lesson: 45minutes- 1 hour

Lesson Plan Title: Did You Hear That? Sound

Content Standard: 11- Motion

Materials & Resources: Class textbook, Promethean board, Internet access, CD player, classical music CD, paper, rulers, rubber bands, plastic eggs (with various object inside – pennies, rice, etc.), drinking glasses, water, and paper for foldables.

PLANNING

Unit Goal(s):

- GLE 0307.11.3 Investigate how the pitch and volume of a sound can be changed.

Learning Objectives:

- The learner will learn how to create and determine the pitch and volume of sounds.
 - SPI 0307.11.3 Distinguish between pitch and volume.
 - SPI 0307.11.4 Identify how sounds with different pitch and volume are produced

Enduring Understandings:

- CONCEPT(S):
 - *Sound*: A form of energy that comes from objects that vibrate. Sound travels in waves through solids, liquids, and gases.
 - *Vibrate*: To move back and forth quickly. Something must move in order to make sound.
 - *Pitch*: How high or low a sound is. Objects that vibrate quickly create a high pitch, while objects that vibrate slowly create a low pitch. An object's length can also affect the pitch.
 - *Volume*: How loud or soft a sound is. The more energy used to vibrate an object, the louder the sound it makes.
- ESSENTIAL QUESTIONS:
 - What is sound, and how is it created?
 - What is pitch?
 - What is volume?
 - How can the pitch and volume of a sound be changed or altered?

Interdisciplinary Connections:

Math: 0306.5.1 Collect and organize data using observations, surveys, and experiments.

Students will be collecting data during group experiments and will be analyzing sound waves.

INSTRUCTION

INTRODUCTION or Anticipatory Set **Time: 3-5 minutes**

The teacher will begin the lesson by building on the students' prior knowledge. The teacher will have students listen to a piece of music. The teacher will ask the students to notice if the piece gets louder or softer, and if the instruments played both high notes and low notes. Once the music has stopped, the teacher will ask the students what they heard. Did they hear the music get louder or softer, or were certain notes high, while others were low? The teacher will then begin the whole group lesson on sound, pitch, and volume.

BODY (Activities & Practice)

Activities **Time: 15-20 minutes**

- Start the activities by telling the students that they will be learning about how sound is created and how pitch and volume can be used to compare and alter sounds.
- The teacher will discuss the vocabulary: sound, vibrate, pitch, and volume.
- Sound and Vibration Discussion
 1. The teacher will ask the students to open their Science textbooks to page 341 and think about sounds that they hear everyday. The teacher will ask the students to think about some of the sounds we hear in the classroom on a daily basis. Finally, the teacher will ask the student how they think these sounds are produced.
 2. The teacher will use the Promethean board to create a whole class graphic organizer. This will contain the **for** main concepts covered during the lesson; sound, pitch, vibration, and volume.
 3. The teacher will explain how sound is created. **Sound** is produced through sound waves and vibration. The teacher will use the Promethean board to show the differences in sound waves and will discuss **vibration**, to move back and forth quickly.
 4. Next, the teacher will expand upon sound waves and discuss how sound can travel through solids, liquids, or gas (air). To show how sound waves travel through water, the teacher will tap a glass of water and show the vibrations.
 5. The teacher will use a Ukulele to demonstrate sound made through vibration.
- Volume and Pitch Discussion
 1. The teacher will talk about what makes sounds different.
 2. One way to affect sound is through **volume**, how loud or soft a sound is. The teacher will discuss how the more energy used to vibrate an object the louder the sound becomes.
 3. The teacher will ask the student to demonstrate volume by first tapping their foot, then stomping it. The energy has increased; therefore, the volume increased.
 4. The other way to affect sound is through **pitch**, how high or low a sound is. The teacher will discuss how to change the pitch of a sound.
 5. If an object vibrates quickly, it has a high pitch. If an object vibrates slowly, it has a low pitch.
 6. Other things that affect pitch is an object's length and thickness.
 7. The teacher will demonstrate this with the use of the Promethean board. On the Promethean board, the teacher will have created simple activities to interact with. For example, on one activity, students will have to decide what objects are high pitched or low pitched and drag them into the corresponding box.
- The student will practice producing sound and changing the sound's pitch and volume during the center activities.

Practice/Assessment**Time: 20 minutes**

- Centers: The students will be divided into assigned groups and will rotate among centers to increase student comprehension. The students will have five minutes at each station. The student will go to each center and perform a task and answer a few questions about the activities they completed in that center.

Center #1 – Ruler activity: Students will place a ruler on a desk. Next, they will extend half of it over the edge of the desk. They will hold one end of the ruler down, and tap the other end and feel the vibration. The student will have to make predictions, discuss what happened, and answer questions pertaining to the task.

- What happens when you tap the end of the ruler?
- If you moved the ruler off the table more, what do you think would happen?
- Does the length of the ruler affect the pitch? Why?

Center #2 – Rubber band activity: The student will have to stretch rubber bands to create different pitches. The students will answer questions on how they changed the pitch and what would happen if you used a thicker or thinner rubber band.

- When you plucked the rubber band, did it make a high or low pitch sound?
- Would the pitch or sound be changed if the rubber band was thicker or thinner? Why?
- How could you increase the volume?
- How could you decrease the volume?

Center #3 – Water glass activity: There will be four to five glasses filled with various levels of water. The students will use a spoon or other object to tap the glasses and determine how the pitch is affected by the water level in the glasses. The student will have to figure out how to adjust the water levels to find a certain pitch.

- How does the water affect the sound?
- What would happen to the pitch if you pour some of the water out?
- What would happen if you added water?
- Would the sound change if you tapped the glasses with another object?

Center #4 – Egg activity: The student will be given a set of five plastic eggs. Each egg has a different object in it. They must shake the eggs to increase and decrease volume. Then, they must determine what object they think is in each egg. Finally, they will have to determine which egg made the highest and lowest pitch.

- When shaking the eggs, can you tell a difference in pitch?
- What eggs made a higher pitched sound?
- What eggs made a louder pitched sound?
- How could you increase or decrease the volume?
- What object do you think is in each egg to create sound?

- Once all students have completed the rotation, all students will return to their desks.

CLOSURE Time: 10 minutes – remainder

- Once all students have returned to their desks, the teacher will briefly ask the student to talk about what they did in each center. The teacher will ask the students to share what they have learned. *If time allows the teacher will show the students an interactive website that shows how to play glass bottles to make a song (<http://www.philtulga.com/water.html#virtual>).
- Finally, the students will complete a foldable flip book. The students will divide a piece of paper into four equal parts. Then, the students will write one of the vocabulary words in each of the boxes. Next, they must give the definition of the each vocabulary word and draw a picture to go along with that word in the space under the flap for each word. For example, under sound, they

might draw different sound waves along with the definition (The teacher will have an example for students to use as a guide).

ASSESSMENT

Evaluation:

Informal: Question the students throughout the lesson to see what they know about the topic and vocabulary used during the lesson. The center work will also provide the teacher with information about how much the students understood and retained the material covered during the direct instruction.

Formal: Collect the foldable flip book. The teacher will see if they knew the correct definition to the vocabulary and if they could illustrate an example of each.

Alternative and/or Supplemental Activities/Extensions:

To extend and supplement this lesson, teach more in depth about the major concepts and include more advanced vocabulary like frequency and perform more experiments with sound. The teacher may wish to explain and demonstrate how sound moves through different types of matter or how sound moves through different solids. If time allows, the teacher will show the students a short BrainPop video that reviews the major concepts learned during the lesson.

Reteaching:

The teacher might demonstrate vibration, pitch, and volume by using more instruments in the classroom such as a drum, guitar, step bells, hand bells, and cymbals. The teacher may also find books that discuss the major concepts more in depth. The teacher may also find a short video or more interactive activities to perform on the Promethean board.

References:

Technology:

*Web demonstration - <http://www.philtulga.com/water.html#virtual>

BrainPop Jr.- <http://www.brainpopjr.com>

CD- Collection of classical music

Class Text:

Hackett, J.K & Moyer, R.H. (2010). *Tennessee Science: A closer look*. Macmillan/McGraw-Hill. Columbus:OH, McGraw-Hill Companies, Inc. 341 (Chapter 7, Lesson 2: Sound)